

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1. – 10. (cancelled)

11. (new) A metallic substrate having a deformable vitreous coating, obtainable by a process comprising

- (a) applying an alkali metal silicate-containing coating sol to the substrate to provide a coating layer; and
- (b) thermally densifying the coating layer of (a) by a two-stage heat treatment comprising, in a first stage, a heat treatment carried out either (A) in an oxygen-containing atmosphere or (B) in a vacuum at a residual pressure of ≤ 15 mbar and, in a second stage, a heat treatment in a low-oxygen atmosphere up to full densification with formation of a vitreous layer.

12. (new) The substrate of claim 11, wherein the heat treatment of the first stage is carried out according to alternative (A) at an end temperature of up to about 400°C.

13. (new) The substrate of claim 11, wherein the heat treatment of the first stage is carried out according to alternative (B) at an end temperature of up to

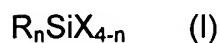
about 500°C.

14. (new) The substrate of claim 11, wherein the heat treatment of the second stage is carried out at an end temperature in a range of from 400° to 600°C.

15. (new) The substrate of claim 11, wherein the heat treatment of the second stage is carried out in an inert gas atmosphere.

16. (new) The substrate of claim 11, wherein the process further comprises cooling the heat-treated substrate in an oxygen-containing or low-oxygen atmosphere.

17. (new) The substrate of claim 11, wherein the alkali metal silicate-containing coating sol is obtainable by a process comprising a hydrolysis and polycondensation of one or more silanes of formula (I)



wherein the radicals X independently represent hydrolyzable groups or hydroxyl groups, the radicals R independently represent hydrogen, alkyl, alkenyl and alkynyl groups having up to 4 carbon atoms and aryl, aralkyl and alkaryl groups having from 6 to 10 carbon atoms, and n is 0, 1 or 2, with the proviso that at least one silane where n = 1 or 2 is used,
or oligomers derived therefrom,
in the presence of

- (a) at least one compound selected from oxides and hydroxides of alkali metals and alkaline earth metals, and
- (b) optionally, nanoscale SiO₂ particles.

18. (new) The substrate of claim 17, wherein the at least one compound is used in such an amount that an atomic ratio Si : (alkali metal and/or alkaline earth metal) is in a range of from 20:1 to 7:1.

19. (new) The substrate of claim 18, wherein the atomic ratio is from 15:1 to 10:1.

20. (new) The substrate of claim 16, wherein an average value of n in the silanes of formula (I) is from 0.2 to 1.5.

21. (new) The substrate of claim 20, wherein the average value of n is from 0.5 to 1.0.

22. (new) The substrate of claim 11, wherein a thickness of the vitreous coating is from 1 to 6 μm.

23. (new) The substrate of claim 22, wherein the thickness is from 1.5 to 5 μm.

24. (new) The substrate of claim 22, wherein the thickness is from 2.5 to 4.5 μm .
25. (new) The substrate of claim 11, wherein the substrate has been subjected to a cold forming.
26. (new) The substrate of claim 11, wherein the substrate has a structured surface.
27. (new) The substrate of claim 11, wherein the substrate comprises at least one metal selected from aluminum, tin, zinc, copper, chromium and nickel.
28. (new) The substrate of claim 11, wherein the substrate comprises at least one of steel, an aluminum alloy, a magnesium alloy and a copper alloy.
29. (new) The substrate of claim 11, wherein the substrate comprises at least one of steel, stainless steel, zinc-plated steel, chromium-plated steel and enameled steel.
30. (new) A process for making a metallic substrate having a deformable vitreous coating, wherein the process comprises
- (a) applying an alkali metal silicate-containing coating sol to the substrate to provide a coating layer on the substrate; and

(b) thermally densifying the coating layer of (a) by a two-stage heat treatment comprising, in a first stage, a heat treatment carried out either (A) in an oxygen-containing atmosphere or (B) in a vacuum at a residual pressure of ≤ 15 mbar and, in a second stage, a heat treatment in a low-oxygen atmosphere up to full densification with formation of a vitreous layer.

31. (new) The process of claim 30, wherein the heat treatment of the first stage is carried out according to alternative (A) at an end temperature of up to about 400°C.

32. (new) The process of claim 31, wherein the oxygen-containing atmosphere comprises from 15 % to 90 % by volume of oxygen.

33. (new) The process of claim 30, wherein the heat treatment of the first stage is carried out according to alternative (B) at an end temperature of up to about 500°C.

34. (new) The process of claim 33, wherein the heat treatment is carried out at an end temperature of up to about 200°C and at a residual pressure of ≤ 5 mbar.

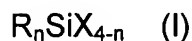
35. (new) The process of claim 30, wherein the heat treatment of the second stage is carried out at an end temperature in a range of from 400° to 600°C.

36. (new) The process of claim 35, wherein the heat treatment of the second stage is carried out at an end temperature in the range of from 540° to 560°C and in an atmosphere which comprises ≤ 0.5 % by volume of oxygen.

37. (new) The process of claim 35, wherein the heat treatment of the second stage is carried out in an inert gas atmosphere.

38. (new) The process of claim 30, wherein the process further comprises cooling the heat-treated substrate at a cooling rate of from 1 to 10 K/min.

39. (new) The process of claim 30, wherein the alkali metal silicate-containing coating sol is obtainable by a process comprising a hydrolysis and polycondensation of one or more silanes of formula (I)



wherein the radicals X independently represent hydrolyzable groups or hydroxyl groups, the radicals R independently represent hydrogen, alkyl, alkenyl and alkynyl groups having up to 4 carbon atoms and aryl, aralkyl and alkaryl groups having from 6 to 10 carbon atoms, and n is 0, 1 or 2, with the proviso that at least one silane where n = 1 or 2 is used,

or oligomers derived therefrom,

in the presence of

(a) at least one compound selected from oxides and hydroxides of alkali metals and alkaline earth metals, and

(b) optionally, nanoscale SiO₂ particles.

40. (new) The process of claim 39, wherein the at least one compound is used in such an amount that an atomic ratio Si : (alkali metal and/or alkaline earth metal) is in a range of from 20:1 to 7:1.

41. (new) The process of claim 40, wherein the atomic ratio is from 15:1 to 10:1.

42. (new) The process of claim 41, wherein an average value of n in the silanes of formula (I) is from 0.2 to 1.5.

43. (new) The process of claim 42, wherein the average value of n is from 0.5 to 1.0.